

(19) World Intellectual Property
Organization
International Bureau



(43) International Publication Date
22 August 2002 (22.08.2002)

PCT

(10) International Publication Number
WO 2002/064631 A3

(51) International Patent Classification: C07K 14/705,
C12N 15/12, 15/62, C07K 16/18, C12Q 1/68, C12N 5/10,
G01N 33/50

(74) Agents: TESKIN, Robin, L. et al.; Crowell & Moring,
L.L.P., 1001 Pennsylvania Avenue, N.W., Washington,
D.C. 20004 (US).

(21) International Application Number:
PCT/US2002/000198

(81) Designated States (national): AE, AG, AL, AM, AT, AU,
AZ, BA, BB, BG, BR, BY, BZ, CA, CH, CN, CO, CR, CU,
CZ, DE, DK, DM, DZ, EC, EE, ES, FI, GB, GD, GE, GH,
GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KP, KR, KZ, LC,
LK, LR, LS, LT, LU, LV, MA, MD, MG, MK, MN, MW,
MX, MZ, NO, NZ, OM, PH, PL, PT, RO, RU, SD, SE, SG,
SI, SK, SL, TJ, TM, TN, TR, TT, TZ, UA, UG, US, UZ,
VN, YU, ZA, ZM, ZW.

(22) International Filing Date: 3 January 2002 (03.01.2002)

(25) Filing Language: English

(26) Publication Language: English

(30) Priority Data:
60/259,227 3 January 2001 (03.01.2001) US
60/284,547 19 April 2001 (19.04.2001) US

(84) Designated States (regional): ARIPO patent (GH, GM,
KE, LS, MW, MZ, SD, SL, SZ, TZ, UG, ZM, ZW),
Eurasian patent (AM, AZ, BY, KG, KZ, MD, RU, TJ, TM),
European patent (AT, BE, CH, CY, DE, DK, ES, FI, FR,
GB, GR, IE, IT, LU, MC, NL, PT, SE, TR), OAPI patent
(BF, BJ, CF, CG, CI, CM, GA, GN, GQ, GW, ML, MR,
NE, SN, TD, TG).

(71) Applicant (for all designated States except US): SENO-
MYX, INC. [US/US]; Suite 160, 11099 N. Torrey Pines
Road, La Jolla, CA 92037 (US).

Published:

— with international search report

(72) Inventors; and

(75) Inventors/Applicants (for US only): ADLER, Jon, Elliott
[US/US]; Apt. 15, 1099 Turquoise Street, San Diego, CA
92109 (US). LI, Xiaodong [CN/US]; Apt. 3, 3435 Waco
Street, San Diego, CA 92117 (US). STASZEWSKI, Lena
[SE/US]; 8270 Calle Nueva, San Diego, CA 92126 (US).
O'CONNELL, Shawn [US/US]; 417 Village Run East,
Encinitas, CA 92024 (US). ZOZULYA, Sergey [RU/US];
14481 Yazoo Street, San Diego, CA 92129 (US).

(88) Date of publication of the international search report:
1 April 2004

For two-letter codes and other abbreviations, refer to the "Guidance Notes on Codes and Abbreviations" appearing at the beginning of each regular issue of the PCT Gazette.

(54) Title: T1R TASTE RECEPTORS AND GENES ENCODING SAME

(57) Abstract: Newly identified mammalian taste-cell-specific G protein-coupled receptors, and the genes and cDNA encoding said receptors are described. Specifically, T1R G protein-coupled receptors active in taste signaling, and the genes and cDNA encoding the same, are described, along with methods for isolating such genes and for isolating and expressing such receptors. Methods for representing taste perception of a particular taste stimulus in a mammal are also described, as are methods for generating novel molecules or combinations of molecules that elicit a predetermined taste perception in a mammal, and methods for stimulating one or more tastes. Further, methods for stimulating or blocking taste perception in a mammal are also disclosed.

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INTERNATIONAL SEARCH REPORT

onal Application No
PCT/US 02/00198

A. CLASSIFICATION OF SUBJECT MATTER IPC 7 C07K14/705 C12N15/12 C12N15/62 C07K16/18 C12Q1/68 C12N5/10 G01N33/50	
According to International Patent Classification (IPC) or to both national classification and IPC	
B. FIELDS SEARCHED Minimum documentation searched (classification system followed by classification symbols) IPC 7 C07K C12N C12Q G01N	
Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched	
Electronic data base consulted during the international search (name of data base and, where practical, search terms used) EPO-Internal, EMBL, WPI Data, PAJ, MEDLINE, BIOSIS, EMBASE	
C. DOCUMENTS CONSIDERED TO BE RELEVANT	
Category * Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
<input checked="" type="checkbox"/> HOON M A ET AL: "PUTATIVE MAMMALIAN TASTE RECEPTORS: A CLASS OF TASTE-SPECIFIC GPCRS WITH DISTINCT TOPOGRAPHIC SELECTIVITY" CELL, MIT PRESS, CAMBRIDGE, MA., US, vol. 96, 19 February 1999 (1999-02-19), pages 541-551, XP000922524 ISSN: 0092-8674 the whole document --- --- -/-	1-3, 7-13, 17-23, 27-33, 37-43, 47-55, 59-67, 71-79, 83-91, 95-104, 108-178, 182-188, 192-199, 204-212, 216-234
<input checked="" type="checkbox"/> Further documents are listed in the continuation of box C.	<input checked="" type="checkbox"/> Patent family members are listed in annex.
* Special categories of cited documents: "A" document defining the general state of the art which is not considered to be of particular relevance "E" earlier document but published on or after the international filing date "L" document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (see specification) "O" document relating to an oral disclosure, use, exhibition or other means "P" document published prior to the international filing date but later than the priority date claimed	
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Date of the actual completion of the international search	Date of mailing of the international search report
19 November 2003	09/12/2003
Name and mailing address of the ISA European Patent Office, P.B. 5818 Patentlaan 2 NL - 2280 HV Rijswijk Tel. (+31-70) 340-2040, Tx 31 651 epo nl, Fax: (+31-70) 340-3016	Authorized officer Mueller, F

INTERNATIONAL SEARCH REPORT

Int. Patent Application No.

PCT/US 02/00198

C. (Continuation) DOCUMENTS CONSIDERED TO BE RELEVANT

Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
(X)	LI XIAODONG ET AL: "Human receptors for sweet and umami taste" PROCEEDINGS OF THE NATIONAL ACADEMY OF SCIENCES OF USA, NATIONAL ACADEMY OF SCIENCE. WASHINGTON, US, vol. 99, no. 7, 2 April 2002 (2002-04-02), pages 4692-4696, XP002254830 ISSN: 0027-8424	1-3, 7-13, 17-23, 27-33, 37-43, 47-55, 59-67, 71-79, 83-91, 95-104, 108-178, 182-188, 192-199, 204-212, 216-234
(X)	the whole document --- ✓ WO 95 08627 A (CIBA GEIGY AG ; FLOR PETER JOSEF (DE); KUHN RAINER (DE); LINDAUER K) 30 March 1995 (1995-03-30)	1-3, 7-13, 17-23, 27-33, 37-43, 47-55, 59-67, 71-79, 83-91, 95-104, 108-178, 182-188, 192-199, 204-212, 216-234
(X)	the whole document --- ✓ DATABASE EMBL 'Online! embl heidelberg; Acc#: AC062024, 21 June 2000 (2000-06-21) XP002262036	1-3, 7-13, 17-23, 27-33, 37-43, 47-55, 59-67, 71-79, 83-91, 95-104, 108-178, 182-188, 192-199, 204-212, 216-234
	99,721% identity in 1739 bp overlap to claimed seq id 15. the whole document ---	-/--

INTERNATIONAL SEARCH REPORT

International Application No.

PCT/US 02/00198

C. (Continuation) DOCUMENTS CONSIDERED TO BE RELEVANT

Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
<p>(X)</p>	<p>ADLER E ET AL: "A NOVEL FAMILY OF MAMMALIAN TASTE RECEPTORS" CELL, CELL PRESS, CAMBRIDGE, MA, US, vol. 100, no. 6, 17 March 2000 (2000-03-17), pages 693-702, XP000982304 ISSN: 0092-8674 cited in the application</p> <p>the whole document -----</p>	<p>1-3, 7-13, 17-23, 27-33, 37-43, 47-55, 59-67, 71-79, 83-91, 95-104, 108-178, 182-188, 192-199, 204-212, 216-234</p>

INTERNATIONAL SEARCH REPORT

national application No.
PCT/US 02/00198

Box I Observations where certain claims were found unsearchable (Continuation of Item 1 of first sheet)

This International Search Report has not been established in respect of certain claims under Article 17(2)(a) for the following reasons:

1. ☐ Claims Nos.:
because they relate to subject matter not required to be searched by this Authority, namely:

2. ☒ Claims Nos.:
because they relate to parts of the International Application that do not comply with the prescribed requirements to such an extent that no meaningful International Search can be carried out, specifically:
see FURTHER INFORMATION sheet PCT/ISA/210

3. ☐ Claims Nos.:
because they are dependent claims and are not drafted in accordance with the second and third sentences of Rule 6.4(a).

Box II Observations where unity of invention is lacking (Continuation of Item 2 of first sheet)

This International Searching Authority found multiple inventions in this International application, as follows:

1. ☐ As all required additional search fees were timely paid by the applicant, this International Search Report covers all searchable claims.

2. ☐ As all searchable claims could be searched without effort justifying an additional fee, this Authority did not invite payment of any additional fee.

3. ☐ As only some of the required additional search fees were timely paid by the applicant, this International Search Report covers only those claims for which fees were paid, specifically claims Nos.:

4. ☐ No required additional search fees were timely paid by the applicant. Consequently, this International Search Report is restricted to the invention first mentioned in the claims; it is covered by claims Nos.:

Remark on Protest

- ☐ The additional search fees were accompanied by the applicant's protest.
- ☐ No protest accompanied the payment of additional search fees.

FURTHER INFORMATION CONTINUED FROM PCT/ISA 210

Continuation of Box I.2

Claims Nos.:

4,5,6,14,15,16,24,25,26,34,35,36,44,45,46,56,57,58,68,69,70,80,81,82,92,9
3,94,105,106,107,179,180etc

Present claims

4,5,6,14,15,16,24,25,26,34,35,36,44,45,46,56,57,58,68,69,70,80,81,82,92,9
3,94,105,106,107,179,180,181,189,190,191,201,202,203,213,214,215,relate
to an extremely large number of possible
compounds/products/apparatus/methods. In fact, the claims contain so many
options, variables, possible permutations and provisos
that a lack of clarity (and/or conciseness) and support within the
meaning of Article 6 PCT arises to such an extent as to render a
meaningful search of the claims impossible. Consequently, no search has
been carried out for those parts of the application.

The applicant's attention is drawn to the fact that claims, or parts of
claims, relating to inventions in respect of which no international
search report has been established need not be the subject of an
international preliminary examination (Rule 66.1(e) PCT). The applicant
is advised that the EPO policy when acting as an International
Preliminary Examining Authority is normally not to carry out a
preliminary examination on matter which has not been searched. This is
the case irrespective of whether or not the claims are amended following
receipt of the search report or during any Chapter II procedure.

INTERNATIONAL SEARCH REPORT

Int. Application No.
PCT/US 02/00198

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
WO 9508627 A	30-03-1995	AU 695641 B2	20-08-1998
		AU 7615994 A	10-04-1995
		CA 2171206 A1	30-03-1995
		WO 9508627 A1	30-03-1995
		EP 1199359 A1	24-04-2002
		EP 0720650 A1	10-07-1996
		FI 961251 A	18-03-1996
		HU 74247 A2	28-11-1996
		JP 9503913 T	22-04-1997
		NO 961115 A	19-03-1996
		NZ 273015 A	22-09-1997
		US 2003113868 A1	19-06-2003
		US 6228610 B1	08-05-2001
		US 2002127638 A1	12-09-2002
